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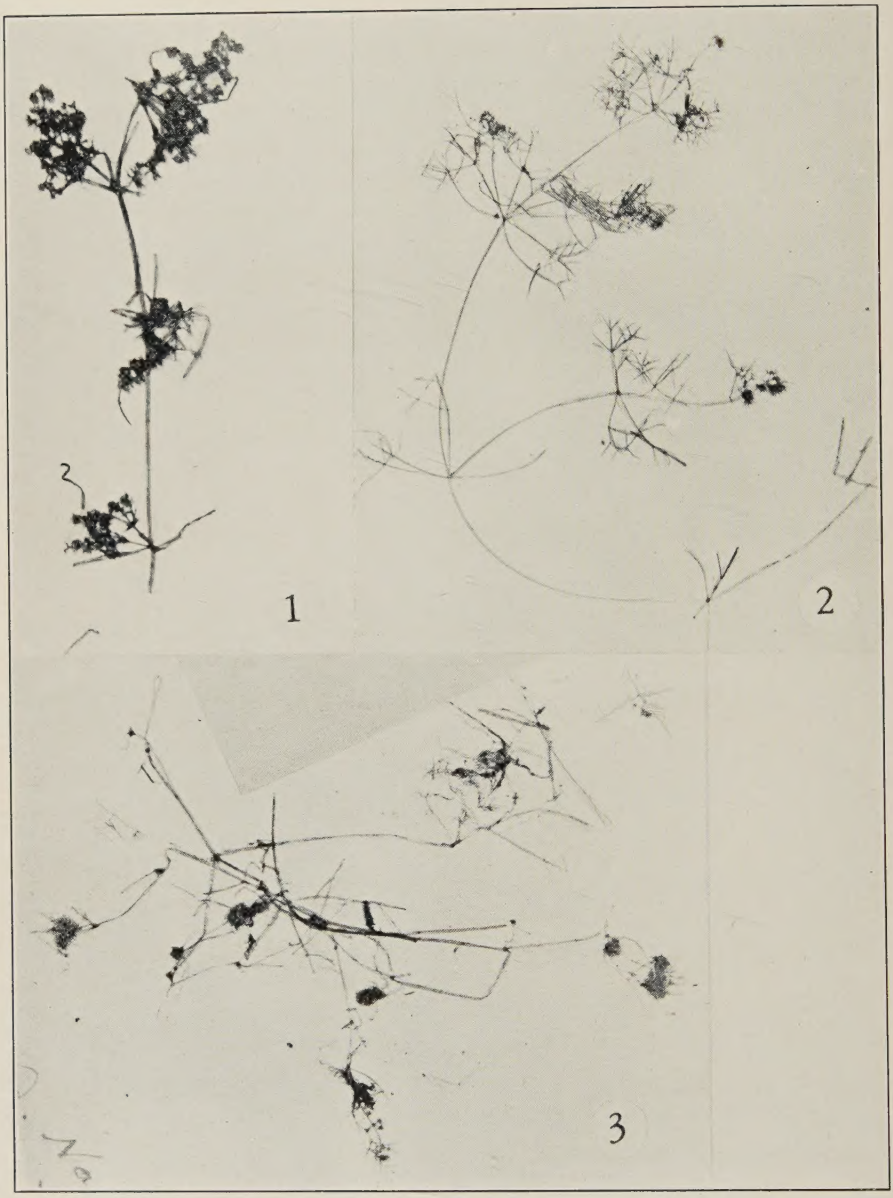

Photo. E. A. Robinson

NITELLA MORONGII Allen, emend. Fig. 1, compact form, LECTOTYPE of *N. Morongii* Allen, × 1.2; fig. 2, typical form, *E. T. Moul*, no. 3173 (RDW), × 0.7; fig. 3, typical form, TYPE of *N. maxceana* Allen, × 0.9.

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MONOGRAPHIC STUDIES ON THE CHARACEAE. I. EMENDATION OF NITELLA MORONGII

R. D. Wood

(Plate 1119)

T. F. Allen (Bull. Torrey Bot. Cl. **14:** 214. 1887) described a new species of Characeae, *Nitella Morongii* Allen, based on a collection cited as ". . . gathered by the Rev. Thos. Morong, on the Island of Nantucket, in a very muddy pool, July 21st, 1887." He later (The Characeae of America, part **2**, fasc. 2: pl. 16. 1894. New York) illustrated the new species. Since Allen's death in 1902, this species has caused certain taxonomic difficulties. Through the cooperation of M. S. Doty, the writer has had the opportunity to study a series of specimens from the Woods Hole region, and feels obligated to attempt to clarify the apparent facts about the species and summarize the information.

The collection made by Rev. Thomas Morong includes a series of possibly fifty specimens. This series is quite consistent, and duplicates which have been issued to various herbaria (including MISS, MIN, UC, FH)[1] are very good. The majority of specimens are fertile and mature, and exhibit about the same gross appearance. Among the specimens seen by the writer, none has been specified as the type. Further, the writer has been unable to discover the specimen from which the published drawing was

[1] Abbreviations of herbarium names follow Lanjouw, Chron. Bot. 5: 142–50. 1939, with the exceptions of the private herbaria of W. R. Taylor (WRT), M. S. Doty (MSD), E. T. Moul (ETM), the writer's herbarium (RDW), and the herbarium of the Marine Biological Laboratory, Woods Hole, Mass. (MBL).

made; but a photograph of *N. Morongii* apparently by T. F. Allen is extant in the herbarium of the New York Botanical Garden, accompanied by its original specimen. For this reason, the writer has selected this specimen as the type, and has designated the specimen as follows: "TYPE (lectotype), *Thomas Morong* no. 4, July 21, 1887. In a very muddy pool on the roadside, near Siasconset, Nantucket" (NY) (FIG. 1).

During July, 1947, the writer visited Nantucket, and sought the type locality of this species. Opposite Bloomingdale on the Siasconset Road are no small pools. On this, the east side, was a small *Sphagnum* bog completely covered by a mat; and somewhat farther south was an extensive *Typha* swamp. On the west side of the road was a cattle hole. None of these fit the description of the type locality, and it is concluded that the original pool no longer exists. A thorough search of the existing possible sites turned up no Characeae. Miss Grace Wyatt of the Maria Mitchell Association of Nantucket graciously guided the writer to other likely stations, but without success. No specimens comparable to Morong's plant have been reported since 1887, as far as is known to the writer.

A letter from Morong to Allen concerning his collection is extant in the herbarium of the New York Botanical Garden. The information is as amusing as it is pertinent: "No. 4. The nearest I can come to this is Nitella gracilis, possibly the large, diffuse form which Halstead [Halsted] says on authority of Farlow grows in Nobska Pond, at Woods Holl; but is it not extraordinarily heavy and stout for N. gracilis? If it were not of this order, no one would think of putting such forms together, but you do strange things with Chara— as for instance C. intermedia and C. intermedia var. americana are about as much alike in size as a walnut and a morning glory . . . " Halsted (Proc. Bost. Soc. Nat. Hist. **20**: 176. 1879) published the record of *N. gracilis* Ag. from Nobska Pond. Halsted's specimen is extant in the Farlow Herbarium. The "authority" mentioned was apparently W. A. Setchell or F. S. Collins; but in either case the specimens were distributed as *N. gracilis* f. *brachyphylla* under No. 1195 in the Phycotheca Boreali-Americana. The humor attests to slightly acid opinions by Allen's contemporary bot-

anists. Halsted's plants take on a greater significance as expanded later.

Prior to Morong's type collection, L. L. Dame had collected the same species in the same locality in 1886. The specimens are extant in the New York Botanical Garden, and have been distributed to other herbaria (including UC, F, FH, MISS). Concerning this collection, the label on the specimen (now in herb. NY) from F. S. Collins' herbarium is annotated: "This specimen apparently the first ever found of this species; it remained undetermined until 1887, when Mr. Morong found, at the same place, a Nitella which Dr. Allen named as above [*N. Morongii* Allen]." A comparison of Dame's and Morong's plants shows a decided difference in appearance, but almost complete identity of fundamental features. Dame's plants are densely bushy with well-formed heads about 5–10 mm. in diameter, and regular sterile branchlet whorls similar to *N. gracilis* (Sm.) Ag. On the other hand, Morong's plants have very small fertile heads 2–3 mm. in diameter, and very poorly developed sterile branchlet whorls. A possible explanation for this divergent expression might be suggested by his notes (in herb. NY) as follows: "The pool is one which does not dry up in the summer time, I am told; and is used by horses on the road as a drinking place. Hence, this little plant is constantly trampled by the feet of animals in the mire. It is a wonder how it lives with such usage, and in such dirty water." The present writer is of the opinion that a possible reason that this form has never again been collected is that Morong's plants exhibit a unique physiological expression which resulted from this peculiar combination of adverse circumstances impinging upon the plants in that pool at that season of that year.

A third type of plant which closely resembles Morong's collection is Halsted's *N. gracilis* mentioned above. As stated in Morong's letter to Allen, this plant is relatively large and quite diffuse. It also has characteristic condensed fertile heads and diffuse sterile whorls. Fundamentally, it differs from Dame's collection of 1886 only in being more diffuse. In all ascertainable respects, such as oospore membrane, oospore dimensions, furcation of branchlets, structure of dactyls and mucros, it is identical. Halsted's plant, then, is apparently a more diffuse ecological

expression of *N. Morongii*. This same form has been repeatedly collected at Woods Hole during the last fifty years, and is quite stable in its characteristics. It has been collected from Nobska Pond, Golf Pond, and Harper Pond, where it was found during the summer of 1947 by E. T. Moul (fig. 2).

A fourth plant extant in the New York Botanical Garden is contained in the species-cover for *N. maxceana*. T. F. Allen had a difficult time indeed with this plant. It was at first identified as *N. batrachosperma* (Reich.) Braun, as indicated by written data on the herbarium sheet. It was reported as such by Maria Owen (Plants of Nantucket, p. 74. 1888. Northampton) as the first record of this species for America. Allen (The Characeae of America, part **2**, fasc. 3: 27. 1896. New York) hesitatingly offered a tentative description of this plant under the name *N. maxceana* Allen, as possibly distinct from *N. minuta* Allen and *N. batrachosperma*. The name of his new species, with description accompanied by a specimen, was validly published, as recently pointed out by the present writer (Farlowia **3**: 379. 1948). The only known existing specimen is hereby designated as the type and so indicated on the label accompanying the specimen: "type: July 7, 1887, *Morong*. Maxey's Pond, Nantucket, Mass." (NY) (fig. 3). On comparison with Halsted's plant or with the so-called *N. gracilis* of the Phycotheca Boreali-Americana, one finds *N. maxceana* Allen to be identical with the *N. gracilis* of Halsted and F. S. Collins.

A fifth plant extant in the New York Botanical Garden, where it had remained among the indeterminatae previous to the present study, is accompanied by the data: "Nitella, Woods Holl, Mass. 1883." This plant is almost a perfect intermediate between *N. maxceana* and *N. Morongii*, and helps close the gap between the two supposed species.

The conclusion which apparently must be made is that all the plants mentioned represent merely expressions of *N. Morongii*, and that the "typical" *N. Morongii* is in reality a very extreme abnormality; and *N. gracilis* according to Halsted and *N. maxceana* Allen are the normal form of the species. The description for this species thus requires emendation, and a revision is given below.

Nitella Morongii Allen, emended (fig. 2). Plant monoe-

cious, up to 20 cm. high, delicate: branchlets of two types, including the normally expanded sterile or weakly fertile branchlets, and the greatly reduced sterile branchlets: sterile branchlets 2–5 (–8) in a whorl, 15–26 mm. long, 1–2 times furcate into 3–5 secondary rays, 2–3 tertiary rays: dactyls of sterile branchlets 2–3, 2-celled, the ultimate cell a conical mucro which is early deciduous: fertile branchlets 6–7 in a whorl, twice furcate, greatly reduced, 1–3 (–8) mm. long; 3–5 (–12) such reduced whorls borne on a reduced branch, the entire fertile complex resembling a dense head (or spike); heads appearing axillary in sterile whorls, or terminal, enveloped in weak mucus: dactyls of fertile branchlets 2 (–3), 2-celled, of which one is commonly shorter than the other, terminated by an elongated mucro: gametangia solitary, an oogonium and an antheridium at each fertile branchlet node: oogonia 290–386 μ long by 210–288 μ broad; coronula 35 x 35 μ; oospores 238–268 μ long by 180–210 μ broad; striae of 5 prominent ridges; membrane roughened with anastomosing lines, almost appearing finely reticulate or grumous: antheridia 134–148 μ long by 174–179 μ broad, short-stipitate.—Bull. Torrey Bot. Cl. **14:** 214. 1887, descr.; *N. maxceana* Allen, Char. Amer., part **2**, fasc. 3: 27. 1896; *N. gracilis* (Sm.) Ag., accord. to Halsted, Proc. Bost. Soc. Nat. Hist. **20:** 176. 1879; *N. gracilis* f. *brachyphylla*, accord. to F. S. Collins, in Phyc. B.-A., fasc. xxiv, no. 1195; *N. batrachosperma* (Reich.) Braun, accord. to Allen in Maria Owen, Pl. Nantucket, p. 74. 1888.—MASSACHUSETTS: NANTUCKET CO.: Maxey's Pond, July 7, 1887, *T. Morong* (NY) (TYPE of *N. maxceana*, in New York Bot. Gard.); Siasconset, in a small pond on the south side of Sconset Road opposite "Bloomingdale," July, 1886, *L. L. Dame* (NY, in one P. B.-A. packet, no. 1382); in a very muddy pool on the roadside near Siasconset, July 21, 1887, *T. Morong* (LECTOTYPE in New York Bot. Gard.); ibid., Aug. 23, 1896, *F. S. Collins* (P. B.-A., no. 1382, NY, BRU). DUKES CO.: Naushon Island, Petchett Pond, July 5, 1946, *Hannah Croasdale* (MBL). BARNSTABLE CO.: Golf Pond, July, 1931, *G. M. Gray* (WRT); July 6, 1917, *W. R. Taylor* (WRT); June 24, 1935, *Hannah Croasdale* (WRT); Harper Pond, July 7, 1947, *E. T. Moul*, no. 3173 (ETM, NY, RDW); July 11, 1947, *Urda K. Wood* (NY, RDW); Nobska Pond, July 15, 1894, *W. A. Setchell* and *W. J. V. Osterhout*, no. 644 (FH, MBL, NY, UC); July 15, 1894, *W. A. Setchell* (P. B.-A., no. 1195); Woods Hole, [locality not given] 1883, [coll.?] (NY); *Halsted* (FH) as *N. gracilis*.

Two markedly different forms are recognized as ecological variants: (1) compact form, with heads greatly reduced, 2–5 mm. in diameter, 5–12 fertile whorls on a fertile branch forming a spike-like head (July 21, 1887, *T. Morong* (NY)); and (2) diffuse

form, with heads 5–12 mm. in diameter, 2–4 fertile whorls on a fertile branch, forming a more or less spherical head (July 7, 1887, *T. Morong* (NY)).

Zaneveld (Blumea **4**: 70. 1940) states that in his opinion *N. Morongii* Allen should be united with *N. translucens* Pers., but the present writer has been unable to discover much in common between the two species. A final decision on relationships must await further investigation.

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SOME RESULTS OF A SUMMER'S BOTANIZING IN OKLAHOMA

U. T. Waterfall[1]

During June and July, 1947, the author participated in a project of the Oklahoma Biological Survey which included (1) a study of the floristic composition and ecology of relict Oklahoma grassland sites, and (2) a study of the flora and phytogeography of the state as a whole.

The part of the work first mentioned is being accomplished by studying grassland sites situated throughout the state. Areas were selected which will give a fairly accurate picture of the composition of, and seasonal succession on, the original prairies and plains of our state. In general two kinds of sites have been chosen: (1) meadows, consisting of unplowed prairies which have been saved for hay production, and (2) miscellaneous small areas which have escaped plowing or grazing due to their relative inaccessibility and size (such as small sites surrounded by rocky outcrops, or certain areas in railroad-right-of-ways). The former will not give an altogether true picture of the situation since mowing, too, is selective. It is thought, however, that study of relicts of all kinds will yield results of some value. They will be discussed in a later paper.

The present paper deals primarily with distributional notes concerning species rarely collected in the state, and species

[1] Botanist, Oklahoma Biological Survey.

newly recorded from Oklahoma. The latter are prefixed with an asterisk in the following account.

One of the most interesting and productive regions botanized was the Black Mesa area in western Cimarron County in the western end of the Oklahoma Panhandle. From it have been taken almost a third of the additions to the Oklahoma flora hereinafter recorded. It constitutes a distinct phytogeographic province, called the Mesa de Maya region by Blair and Hubbell.[1] According to Duck and Fletcher[2] 363 square miles of Oklahoma are included in this area, which they call the pinyon-juniper-mesa game type. It is a part of a mesa region extending into our state from northeastern New Mexico and southeastern Colorado. The most distinctive geographic feature of the area is the Black Mesa itself, a sandstone, basalt-capped mesa with an elevation of almost 5,000 feet, rising 500–700 feet above the surrounding terrain.[3] It is the highest point in Oklahoma.

Many of the floral affinities appear to be southwestern as will be evidenced by the enumeration which follows later. The valleys between the mesas are covered with grass and are often characterized by *Opuntia arborescens*. The principle species of the grassland, when not overgrazed, are *Hilaria Jamesii* and *Bouteloua gracilis*, with *Buchloe dactyloides*, *Bouteloua curtipendula* and *Sporobolus cryptandrus* forming conspicuous parts of the vegetation. Other grasses are: *Muhlenbergia Torreyi*, *Triodia pilosa*, *Andropogon saccharoides*, *Panicum obtusum* and *Sitanion Hystrix*. When overgrazed *Muhlenbergia Torreyi*, *Buchloe dactyloides* and *Triodia pilosa* become the common species. On sandy soils *Munroa squarrosa* is locally abundant, increasing under overgrazing.

The mesa slopes are often characterized by *Pinus cembroides* var. *edulis*, *Juniperus monosperma*, and, in some places, by a chaparral of *Quercus* spp., including *Q. grisea*. Other common species include *Rhus trilobata* var. *pilosissima* and *Cercocarpus montana*. Between rock ledges and arroyos on these slopes,

[1] Blair, W. F. and T. H. Hubbell. *The Biotic Districts of Oklahoma.* Am. Midl. Nat. **20**: 425–454. 1938.

[2] Duck, L. G. and Jack B. Fletcher. *A Survey of the Game and Furbearing Animals of Oklahoma.* State Bulletin No. 3: 42. Oklahoma Game and Fish Comm., Oklahoma City, Okla.

[3] Schoff, Stuart L. and J. Willis Stovall. *Geology and Ground Water Resources of Cimarron County, Oklahoma.* Okla. Geol. Surv. Bull. No. 64: 21 and 120. 1943.

where water and soil accumulate, there are found clumps of *Andropogon scoparius*, *Andropogon Gerardi*, *Sorghastrum nutans* and *Panicum virgatum*. These mesic species are not commonly found elsewhere in the surrounding terrain, hence their relict nature in this area is adduced. In these arroyos are also found, sometimes in abundance, *Rubus deliciosus*, *Ribes cereum* and a dwarfed form of *Prunus virginiana*, perhaps var. *melanocarpa*. On the adjacent slopes *Glossopetalon planitierum* often forms large matted clumps. Along an arroyo at the base of a xeric slope was found *Allionia incarnata*, an unexpected addition to the state flora. *Bromus anomalus* var. *lanatipes*, previously unknown from the state, is fairly common along the arroyos and at the bases of rock ledges. Other characteristic species found on the slopes include: *Aristida glauca*, *Bouteloua eriopoda*, *Lycurus phleoides*, *Panicum Hallii*, *Trichachne californica*, *Eriogonum tenellum*, *Eriogonum Jamesii*, *Atriplex canescens*, *Dalea formosa*, *Baccharis Wrightii*, *Pericome glandulosa* and *Stephanomeria pauciflora*. Near the base of the mesa were taken *Aristida divaricata* and *Mentzelia multiflora*, both seldom collected within the state. *Gilia laxiflora* is frequently found on the lower hills, ridges and plains throughout this area.

On the low ridges near the edges of the mesa country some of the characteristic species collected include: *Sitanion Hystrix*, *Eriogonum lachnogynum*, *Dalea Jamesii*, *Psoralea argyrophylla*, *Mentzelia multiflora*, *Oenothera lavandulaefolia*, *Gilia laxiflora*, *Cryptantha Jamesii* var. *multicaulis*, *Baccharis Wrightii*, *Senecio longilobus*, *Senecio tridenticulatus* and *Stephanomeria pauciflora*. On very shallow soil *Paronychia sessiliflora* is often abundant.

Contrasting vegetation types, and still good collecting grounds, are to be found in the extreme southeastern part of the state. For example, near Tom, in McCurtain County, in oak-pine (*Pinus Taeda*) the following species were among those taken: *Kyllinga brevifolia* (previously unreported from the state), *Gillenia stipulata*, *Rhexia mariana* var. *leiosperma*, *Ludwigia hirtella*, *Eryngium prostratum*, *Diodia virginiana* and *Vernonia texana* (new to our flora). In a near-by roadside ditch was found *Verbena bonariensis*, an adventive which has either recently spread into the state, or has been overlooked previously.

In the near-by cypress swamps (*Taxodium distichum*) were

found: *Polypodium polypodioides* (epiphytic), *Fimbristylis Vahlii*, *Sabal minor*, *Brunnichia cirrhosa*, *Cassia Tora*, *Rotala ramosior* var. *interior*, *Ludwigia glandulosa* var. *typica*, *Trepocarpus Aethusae*, *Asclepias variegata*, *Hydrolea ovata*, *Heliotropium indicum*, *Justicia lanceolata* and *Spermacoce glabra*.

Other contrasting regions will be dealt with in subsequent papers, and all will be treated more fully as more data become available.

There follows an annotated enumeration of some of the more interesting plants collected. It includes 29 additions to the state flora. All the specimens cited are in the Bebb Herbarium of the University of Oklahoma. Duplicates of most of them will be available for distribution to a few other herbaria at a later date.

Enumeration of Species

Ephedra antisyphilitica Berl. ex C. A. Meyer.

Cutler[1] cites only the following from Oklahoma: "Along the Red River, Harmon Co., Dec. 16, 1933, *Goodman* and *Barkley*." In our herbarium we have material from Beckham, Jackson, Harmon, Cotton and Greer Counties.

*Agropyron Smithii Rydb., var. molle (Scribn. and Smith) Jones. *Waterfall* 7511, sandstone slopes, 7 miles southeast of Kenton, Cimarron Co., July 9, 1947. Hitchcock[2] states that var. *molle* has "about the same range as the species." Of 22 sheets in our herbarium we have only the above representing var. *molle*. The others are representative of var. **typica**, nom. nov., *A. Smithii* Rydb., Mem. N. Y. Bot. Gar. **1**: 64. 1900, sens. strict.

*Bromus anomalus Rupr., var. lanatipes (Shear) Hitchc. The pubescent-sheathed variety of *B. anomalus* was collected as *Waterfall* 7465, in arroyos running up the northeast slope of Black Mesa, 4 mi. north of Kenton, Cimarron Co., July 9, 1947; and *Waterfall* 7506, sandstone slopes 7 miles southeast of Kenton, Cimarron Co., July 9, 1947.

Muhlenbergia arenicola Buckl. is fairly common in the Black Mesa area. Since it increases under conditions of overgrazing, its presence in abundance serves as an indicator of overgrazing in this region. A collection was made as *Waterfall* 7534.

*Stipa Scribneri Vasey. Apparently referable to this species is material collected as *Waterfall* 7493, mesa slopes 1 mile west and 1–2 miles WSW of Kenton, Cimarron Co., July 9, 1947.

[1] Cutler, Hugh Carson, *Monograph of the North American Species of the Genus Ephedra*, Ann. Mo. Bot. Gard. **26**: 415. 1939.

[2] Hitchcock, A. S. *Manual of the grasses of the United States.* USDA Misc. Publ. 200: 233. 1935.

According to Hitchcock[1] the species has been previously known from the adjoining states of Colorado and New Mexico. Of the five species of Stipa now known in Oklahoma (Featherly[2] has listed four) two, *S. neomexicana* and *S. Scribneri*, are known only from the Black Mesa area of Cimarron County. Since this constitutes a distinct phytogeographic province, similar to the regions from which the species were previously known, it is not startling that they are found here, but they are unlikely to be found much farther east within the state.

*Trichachne californica (Benth.) Chase was collected as *Waterfall* 7453, in an arroyo running up the northeast slope of the Black Mesa, 4 miles north of Kenton, Cimarron County, July 9, 1947. It is fairly common in this area. Hitchcock[3] states that the species ranges from Texas to Colorado, Arizona and Mexico. Featherly[4] lists only *Trichachne patens* from Oklahoma, stating that it is found in Greer County.

*Kyllinga brevifolia L. A collection taken as *Waterfall* 7593, in oak woods west of Tom, McCurtain County, July 18, 1947, is referred to this species since it has obovoid achenes, large scales which are scabrous-keeled, and is of perennial habit. The genus *Kyllinga* is not listed in Jeffs and Little's *checklist*[5]. Small in both his *Flora*[6] and *Manual*[7] gives the range of *K. brevifolia* in the United States as being Georgia to Florida and Texas.

*Kyllinga pumila Michx. was collected as *Goodman* and *Waterfall* 4546 along Little River, north of Broken Bow, McCurtain County. Britton and Brown[8] include "Kansas, Texas" in their range-statement. In checking our herbarium another sheet of this species was found; it is *Bebb* 6108, roadside ditch, Delaware Co., Oct. 7, 1940. Since it is not listed by Jeffs and Little (op. cit.) these collections definitely add the species to the state flora.

Scirpus koilolepis (Steud.) Gleason. [(*Scirpus carinatus* (H. and A.) Gray)]. In our herbarium there is only one sheet of this species from the state. It is *Little* 944, Muskogee Co., June 11, 1927. The author's summer collections provide two additional stations. They are No. 6882, edge of pond 8 miles east and 2½ miles south of Miami, Ottawa Co., June 6, 1947, and No. 7360,

[1] Hitchcock, A. S. *op. cit.* 434, 435.

[2] Featherly, H. I. *Manual of the Grasses of Oklahoma.* Bull. Okla. A. and M. Coll. v. 43 no. 21. 1946.

[3] Hitchcock, A. S. *op. cit.* 551.

[4] Featherly, H. I. *op. cit.* 93.

[5] Jeffs, R. E. and Elbert L. Little. *A Preliminary List of the Ferns and Seed Plants of Oklahoma.* Publ. of the Univ. of Okla. Biol. Surv. v. 2, no. 2. 1930.

[6] Small, J. K. *Flora of the Southeastern United States.* 174. 1903.

[7] Ibid, *Manual of the Southeastern Flora.* 155. 1933.

[8] Britton, Nathaniel Lord and Addison Brown. *Illustrated Flora.* 1: 296. 1936.

edge of pond among stabilized sand dunes, 20 miles west of Medford, Grant Co., July 7, 1947.

*Habenaria lacera (Michx.) R. Br. *Waterfall* 6945, climax prairie, 7.7 miles east of Locust Grove, Mayes Co., June 7, 1947 is referred to this species. No species of *Habenaria* is listed by Jeffs and Little (op. cit.). Stemen and Myers[1] list one species (as *Perularia flava*). The latter is the only species we have in our herbarium. Stevens[2] lists *H. ciliaris* in his Flora, but he only says that it "should be expected in . . . (the) . . . eastern part of the state." At present I do not know of this expectation having been realized. *Habenaria leucophaea* (Nutt.) Gray should be found within the state. Although we have no specimens in our herbarium, and the usual manual range-statements do not include our state, Nuttall[3] in describing *Orchis leucophaea* says "hab. in moist prairies near Kiamecha, Red River". If this statement means the confluence of the Kiamichi River with the Red River it would locate the collection in the southeastern part of the present state of Oklahoma.

*Quercus grisea Liebm. was collected as *Waterfall* 7498 and 7499 on mesa slopes 1 mile west and 1–2 mile WSW of Kenton, Cimarron Co., July 9, 1947. Here it was quite common. Associated with it were *Pinus cembroides* var. *edulis* and *Cercocarpus montanus*.

*Rumex pulcher L. The author's 7576 was taken from a disturbed prairie, 3 miles east of Ft. Towson, Choctaw Co., July 18, 1947. We also have: *Bebb* 4367, along roadside, Cookson Hills, Cherokee Co., June 10, 1939; *Demaree* 12609, moist places, Valiant, McCurtain Co., May 16, 1936; *Waterfall* 2100, along Kiamichi River, 8 miles east of Hugo, Choctaw Co., June 15, 1940.

*Suaeda suffrutescens S. Wats. This southwestern perennial *Suaeda* was collected from two widely separated saline sites in the western part of the state. The collections are the author's 7296, saline plain 4½ miles south of Hollister, Tillman Co., June 27, 1947, and No. 7544, saline-gypseous flats, 16 miles east of Orienta, Major Co., July 11, 1947.

*Allionia incarnata L. This southwestern species was an unexpected find on the Black Mesa. It was collected as *Waterfall* 7474, zeric NE slopes of Black Mesa, 4 miles north of Kenton, Cimarron Co., July 9, 1947. *Erigeron divergens* var. *cinereus* was so abundant that it gave the slopes a grayish-green color which

[1] Stemen, Thomas R. and W. Stanley Myers. *Oklahoma Flora*. 1937.

[2] Stevens, G. W. *The Flora of Oklahoma*. Unpublished MSS. Original deposited in the Widener Library of Harvard University. 1916.

[3] Nuttall, Thomas. *Collections toward a Flora of the Territory of Arkansas*. Transactions of the American Philosophical Society, vol. 5, n. s. 1837.

could be seen for a mile or more. Other associated species included *Eriogonum tenellum* and *Dalea formosa*.

*Paronychia sessiliflora Nutt. The author's 7500 from mesa slopes west of Kenton, Cimarron Co., is referred to this species. Although the species appears in Jeffs and Little (op. cit.) and Stemen and Myers (op. cit.) we have in our herbarium only one other sheet, *Barkley* 465, twenty miles west of Boise City, Cimarron Co., July 8, 1928. It was determined as *Leptodactylon caespitosum* Nutt., and in 1946 was referred to *Paronychia sessiliflora* by Goodman. Core[1] does not record it from Oklahoma. The species was fairly abundant where the author collected it.

Loeflingia texana Hook. The following collections are so referred: *Waterfall* 7115, sand dunes stabilized by *Artemisia filifolia* and *Plantago Purshii*, 5 miles north of Mooreland, Woodward Co., June 18, 1947; *Waterfall* 7279, sand dunes covered with *Artemisia filifolia* and *Aphanostephus skirrhobasis* on the north side of the Red River, 4 miles west and 4 south of Randlett, Cotton Co., June 27, 1947. Hopkins[2] has previously reported this plant from Harper County. Apparently it extends across the western part of the state in sand.

*Dianthus Armeria L. The following are referred to this species: *Hopkins* 3255, Dripping Springs, Delaware Co., May 7, 1938; *Waterfall* 7039, along creek 3 miles east and 2 north of Dripping Springs, Delaware Co., June 8, 1947.

*Ribes cereum Dougl. This Rocky Mountain *Ribes* was collected as *Waterfall* 7475, at base of escarpment just below the top of the northeast side of Black Mesa, 4 miles north of Kenton, Cimarron Co., July 9, 1947.

Potentilla recta L. This species, seldom collected in our state, was taken as *Waterfall* 6879, overgrazed pasture, 5½ miles east of Miami, Ottowa Co. It had increased under overgrazing.

Rubus deliciosus Torr. Although recorded by Jeffs and Little (op. cit.) the species is seldom collected in Oklahoma. We have no sheets in our herbarium. *Waterfall* 7469 was collected from the northeast slopes of Black Mesa, 4 miles north of Kenton and 7507 from sandstone slopes 7 miles southeast of Kenton, Cimarron Co., July 9, 1947.

*Hoffmanseggia drepanocarpa Gray was collected as *Waterfall* 7505, mesa slopes, Cimarron Co., July 9, 1947. The collection is so referred because it has characteristic lunate pods and eglandular calyx lobes, pedicels, petioles and rachises.

[1]Core, Earl L. *The North American Species of Paronychia.* Am. Midl. Nat. **26**: 386–387. 1941.

[2]Hopkins, Milton. *Notes from the Bebb Herbarium of the University of Oklahoma.* Rhodora **45**: 268. 1943

Flowers were not present. Rydberg[1] gives the range of the species as: "western Texas to Colorado, Arizona and Chihuahua". Presumably it occurs across New Mexico to the Black Mesa in western Oklahoma.

*Petalostemum decumbens Nutt. was taken as *Waterfall* 7570 from a climax prairie 7 miles west of Hugo, Choctaw Co., July 18, 1947. Other sheets in our herbarium are: *Pearl Nelson* 70, Valliant, McCurtain Co., May 6, 1936; *Demaree* 12641, prairie, McCurtain Co., May 16, 1936; *Waterfall* 677, 3 miles west of Idabel, McCurtain Co., June 4, 1937.

*Rhus microphylla Engelm. This southwestern desert species was collected as *Waterfall* 7220 on the dolomite cap of a butte, 4 miles east and 4 south of Eldorado, Jackson County, June 20, 1947. It was also observed growing in abundance on the adjacent gypsum bluffs along the Red River. Barkley[2] lists the species from Hardeman Co., Texas, which is the adjoining county south of the Red River.

*Rhus trilobata Nutt., var. pilosissima Engl. is fairly common in the Black Mesa area. It is represented by: *Waterfall* 7476, base of escarpment, Black Mesa, 4 miles north of Kenton, Cimarron Co., July 9, 1947. Barkley[3] cites no Oklahoma collections, the nearest station, then known, being near Amarillo, Texas.

*Callirhoe lineariloba (Gray) Gray was collected as *Waterfall* 7284, sand dunes covered with *Artemisia filifolia* and *Aphanostephus skirrhobasis* on the north side of the Red River, 4 miles west and 4 miles south of Randlett, Cotton Co., June 27, 1947.

Cevallia sinuata Lag. was found growing on gypsum bluffs along the Red River, 4 miles east and 4 miles south of Eldorado, Jackson Co., July 29, 1947. It was collected as *Waterfall* 7705. *Waterfall* 7717 was taken from gypsum bluffs, south side of Elm Fork River, 3 miles west and 14 south of Eric, Harmon Co., July 29, 1947. The species is recorded by Jeffs and Little (op. cit.), but must be seldom collected within the state. We have no other specimens in our herbarium.

Echinocactus texensis Hoffer was collected as *Waterfall* 7704 from a buffalo grass (*Buchloë dactyloides*) pasture, 3 miles south of Gould, Harmon County, July 29, 1947. It is not recorded for Oklahoma by Britton and Rose[4] who give the range as "southeastern New Mexico, Texas and northern Mexico." Clark[5] has reported the species from the state: ". . . quite rare

[1] Rydberg, Per Axel, *Caesalpiniaceae*, N. Am. Fl. **23**: 312. 1930.

[2] Barkley, Fred A., *Anacardiaceae*, Flora of Texas **3**: 101. 1943.

[3] Barkley, Fred A., *A Monographic Study of Rhus*. Ann. Mo. Bot. Gard. **24**: 409–410. 1937.

[4] Britton, N. L. and J. N. Rose. *The Cactaceae*. **3**: 181. 1922.

[5] Clark, Ora M. *The Cacti of Oklahoma*. Proc. Okla. Acad. Sci. **13**: 34. 1933.

and local in its distribution over the clay and gypsum brakes of Harmon County." There are no previous collections in our herbarium.

Ludwigia glandulosa Walt., var. typica Munz. To var. *typica* may be referred *Waterfall* 7611, mud flats along creek, 7 miles east of Idabel, McCurtain Co., July 20, 1947. It is somewhat difficult to evaluate the reports of *L. glandulosa* in our flora. Stevens (op. cit.) lists the species, but attributes it to Oklahoma "acc. to Holz. and Olive." Jeffs and Little (op. cit.) list it, but there is no other sheet of var. *typica* in our herbarium. Stemen and Myers include it in their Flora (op. cit.), but their collections are not available for study. Munz[3] gives "southern Illinois and Indiana to eastern Texas" as being the range. This could include eastern parts of our state. At least the above number designates a confirmatory collection.

*Ludwigia glandulosa Walt., var. Torreyi Munz. In our herbarium is one sheet, *Little* 1651, Muskogee Co., June 18, 1927. Since Jeffs and Little's *List* was published in 1930, it is possible that this sheet is the basis for their inclusion of the species. Munz[1] states that the range of var. *Torreyi* includes Florida, Louisiana and Texas. This present report definitely places this variety within the state.

Ludwigia hirtella Raf. *Little* and *Olmstead* collected this species east of Broken Bow, McCurtain Co., June 28, 1930, as their No. 424. *Waterfall* 7597 was taken from oak-pine woods west of Tom, McCurtain Co., July 18, 1947. Munz[2] includes eastern Texas, but not Oklahoma, in his range-citation. Evidently, he had no material from our state. However, Stemen and Myers list it in their *Flora* (op. cit.).

Daucus Carota L. In our herbarium we have only two sheets of this introduced species. They are *Whaley* 63, Miami, Ottawa Co., and *Waterfall* 7018, bluffs along Highway No. 59, Adair Co., June 10, 1947. *D. pusillus* is quite common in Oklahoma.

Breweria Pickeringii (Torr.) Gray was taken as *Waterfall* 7370, stabilized sand dunes, 20 miles west of Medford, Grant Co., July 7, 1947. The species is little collected in our state. In the area where the above were taken it is fairly common. Our specimens have the style barely cleft to entire.

*Gilia laxiflora (Coulter) Osterhout. Referred to this species are: *Waterfall* 7444, sloping plains north of Black Mesa, north of Kenton, Cimarron Co., July 9, 1947; *Waterfall* 7486,

[1] Munz, Phillip A. *The American Species of Ludwigia.* Bull. Torr. Bot. Cl. 71: 164. 1944.

[2] Munz, Phillip A. *The American Species of Ludwigia.* Bull. Torr. Bot. Cl. 71: 157. 1944.

mesa slopes, 1 mile west and 1–2 miles WSW of Kenton, Cimarron Co., July 9, 1947.

*Verbena ambrosifolia Rydb., forma eglandulosa Perry. The forma is not listed from Oklahoma by Perry.[1] The author collected it as *Waterfall* 7437, stony hillside, 16 miles southeast of Kenton, Cimarron Co., July 9, 1947.

*Verbena bonariensis L. This species was collected as *Waterfall* 7599, along ditch, south of Tom, McCurtain Co., July 18, 1947. It has been known previously from near-by Texas, Arkansas and Louisiana.[2]

*Solanum Torreyi Gray, forma **album**, forma nov., corollis albidis. The type of the white-flowered form was collected as *Waterfall* 7340, sand in small stabilized dunes, 1 mile east of Weatherford, Custer Co., July 3, 1947. The forma was also collected as *Waterfall* 7975, limestone ridge, 2 miles east and 7 south of Ada, Pontotoc Co., June 21, 1948.

Verbascum Blattaria L., var. albiflorum Ktze. was collected as *Waterfall* 7000, near pond surrounded by oak-covered, stony slopes, 4 miles north of Highway No. 62 on the Tynor Creek road to Ballard, Adair Co., June 9, 1947. The white-flowered variety is more abundant in southeastern Oklahoma, while the typical, yellow-flowered variety is more common in the northern part of the state.

*Galium concinnum T. and G. I have the following collections of this species: *Waterfall* 6953, deep rich woods along creek south of Dripping Springs Park, Delaware Co., June 7, 1947; *Waterfall* 6968, steep stony bluffs in deep woods along Sager Creek, 1 mile east and 1 north of Mosley School (3 miles west and 2 north of Siloam Springs), Delaware Co., June 8, 1947. I do not find a previous record of *G. concinnum* in our flora.

Lonicera albiflora T. and G. This species has been previously known in our state from the Arbuckle Mountains. It was taken from the Wichita Mountains as *Waterfall* 7321, north slopes of granite mountains south of Lake Altus, Kiowa County, June 28, 1947.

*Aphanostephus ramosissimus DC. was collected as *Waterfall* 7198, on dolomite knoll, 3 miles north of Duke, Jackson County, June 20, 1947; *Waterfall* 7790, saline flat 11 miles south of Gould, Harmon County, June 5, 1948; *Waterfall* 7794, buffalo grass pasture, 3 miles north and ½ mile east of Eldorado, Jackson County, June 5, 1948.

It is true that *Aphanostephus ramosissimus* is listed by Stemen

[1] Perry, Lily M. *A Revision of the North American Species of Verbena.* Ann. Mo. Bot. Gar. **20**: 328. 1933.

[2] Perry, Lily M. *A Revision of the North American Species of Verbena.* Ann. Mo. Bot. Gar. **20**: 254. 1933.

and Myers[1]. However, they do not mention *A. pilosus* Buckley. Their phrase, "foliage hispidulous", plus their range-statement, "Wichita Mountains", leads one to conclude that they actually had *A. pilosus* at hand, especially since Gray[2] includes *A. pilosus* with *A. ramosissimus* as "a remarkably hispid form." Shinners[3] includes "Edwards Plateau and north to the Panhandle" in the range of the species. It has been collected across the Red River near Vernon, Texas (*Shinners* 7978); hence it is not surprising to find it in a part of our state where there are numerous other species with southwestern affinities..

Baccharis Wrightii Gray is a fairly common species in the Black Mesa area in the western end of Cimarron County. The author has several numbers from that area. It is not listed by Jeffs and Little (op. cit.). Stemen and Myers (op. cit.) say that it is found in "dry prairies, Harper County."

Erigeron divergens T. and G., var. cinereus Gray is so abundant on slopes of the Black Mesa that it gives them a grayish-green color which may be seen for a mile or more. The author collected it as his number 7471, xeric northeast slopes of Black Mesa, 4 miles north of Kenton, Cimarron County, July 9, 1947.

Helianthus ciliaris DC. This species, little collected in our state, was taken as *Waterfall* 7417, ditch, 13 miles east of Boise City, Cimarron County, July 9, 1947. Locally it is fairly common in the western part of the Oklahoma Panhandle.

*Rudbeckia missouriensis Engelm. Referred to this species are plants taken as *Waterfall* 7567, prairie, 7 miles west of Hugo, Choctaw County, July 18, 1947. Small[4] states that the range is from Louisiana to Missouri.

Senecio tridenticulatus Rydb. was collected as *Waterfall* 7428, plains 8 miles east and 8 south of Kenton, Cimarron County, July 9, 1947. Greenman[5] lists three of Stevens' collections, without definite locality, from Oklahoma. Duplicates of two of these are all the material we have of this species in our herbarium. It is fairly common in the Black Mesa area of the Panhandle.

*Vernonia texana (Gray) Small was found in oak-pine (*P. Taeda*) woods, 2 miles south and 2 west of Tom, McCurtain County, July 18, 1947. It was collected as *Waterfall* 7589.

Department of Plant Sciences, University of Oklahoma, Norman, Oklahoma

[1] Stemen, Thomas R. and W. Standley Myers. *Oklahoma Flora:* 556. 1937.

[2] Gray, Asa. *Synoptical Flora of North America* 1[2]: 163. 1886.

[3] Shinners, Lloyd H. *Revision of the Genus Aphanostephus* DC. Wrightia 1: 109–111. 1946.

[4] Small, J. K. *Manual of the Southeastern Flora.* 1933.

[5] Greenman, J. M. *Monograph of the North and Central American Species of the Genus Senecio. Part II.* Ann. Mo. Bot. Gard. 3: 179–183. 1916.

Polyploidy in Passiflora lutea.—Nearly fifteen years ago I found *Passiflora lutea* L. in Clarke Co., Virginia, near a limestone bluff overlooking the Shenandoah River. When dug up and moved to The Blandy Experimental Farm a few miles away, the plant thrived and has fruited profusely. Wray M. Bowden reported the $2n$-number of this collection to be 84 and published a root-tip metaphase showing this number of chromosomes (American Journal of Botany 32: 191–201. 1945).

On October 17, 1948, near Lake Drummond in the Great Dismal Swamp, Norfolk Co., Virginia, I came across a fruiting plant of *Passiflora lutea*. It grew among blackberries in a forest opening and on black muck soil. Because Bowden's chromosome-number determination was high for the genus, seed were taken from the Dismal Swamp specimen and planted in our greenhouse. Two seedlings have been cytologically examined: $2n = 24$.

These chromosome counts indicate that polyploidy exists in this species and suggest that there are intraspecific chromosomal races. If such races do occur, I would like to map their geographic—and perhaps ecologic—distributions and, accordingly, would appreciate it if collectors should send me seed or living plants accompanied by statements of exact locality and soil type. Gray's Manual records the species from southern Pennsylvania to Missouri, Texas, and Florida.—J. T. Baldwin, Jr., College of William and Mary, Williamsburg, Virginia.

Does Dicranum arcticum occur in southern central Quebec?—In his paper on Canadian Eastern Arctic mosses [*Musci*, Nat. Mus. of Can. Bulletin No. **97**: 393. 1947], Prof. Wm. C. Steere remarks that *Kiaeria glacialis* (Berggr.) Hagen is "A real circumpolar species of the Arctic zone. . . . Previously only once reported from the Canadian Eastern Arctic, and then from the southernmost [viz., Northern Labrador] part".

Consequently, an apparent problem in distribution arises when one discovers that the same species is listed, under *Dicranum arcticum* Schimp., a synonym, by Abbé Ernest Lepage ["*Liste des Lichens, Mousses et Hépatiques du Québec* . . .", Le Nat. Can. **72**: 319. 1945] for a station considerably south of the known range of the species.

The only record of the species for Quebec is based upon the collection by F. Marie-Anselme from Beauceville, Beauce County. The locality it comes from, lying in south-central Quebec, has not yet yielded any of the floristic elements which have made the Gaspé region the mecca of arctic-alpine species south of the 55th parallel in northeastern North America.

Through the kind courtesy of F. Fabius, s. c., the author has had access to the original collection, *No. 2854*, in the M.-Anselme herbarium, which bears the identification of *Dicranum arcticum*.

Assuming that the leaves bore a "nervure non-dentée", the specimen collected, on soil in a field, May 1, 1939, was named *D. arcticum*. Closer examination of the costa reveals the presence of weak teeth on the upper dorsal side. Transversal sections through the median nerve show it to consist of heterogeneous cells. The serration towards the leaf-apex is poorly developed but the upper leaf-cells are all elongate and porose.

Rather than leave the material under *D. arcticum* it would be more appropriate to place it with *D. scoparium* Hedw. while fully noting that the material shows considerable variation and under certain aspects might pass for *D. Bonjeani* DeNot.—James Kucyniak, Montreal Botanical Garden.

Dicentra Cucullaria f. purpuritincta in Quebec.—*Dicentra Cucullaria* (L.) Bernh. is a very common plant with us, with a distribution extending as far eastward as Rimouski Co. (Lepage), and Gaspé Co.: Ruisseau Sorel (Rousseau) and Mont Saint-Pierre (Dansereau). On the other hand, the more southern *Dicentra canadensis* (Goldie) Walp., is restricted to the Montreal region.

The present note reports the discovery of *Dicentra Cucullaria* (L.) Bernh. f. *purpuritincta* Eames, Rhodora **33:** 169, 1931, in Quebec. It was found on May 4, 1948, at Saint-Jean (Saint-Jean Co.), in a large deciduous wood which surrounds a quarry and which is noted for its rich spring flora. Saint-Jean is located midway between Montreal and the American border.

In the form, the corolla is pink while the sepals are reddish-purple. It was described from southwestern Connecticut and

was noted to be of rather frequent occurrence there. This striking plant exhibits a coloring not common in our spring flowers.—Marcel Raymond, Montreal Botanical Garden.

A most useful Series of Illustrations.—The new venture, Drawings of British Plants[1], will interest all in North America who wish good illustrations of a large proportion of our naturalized flowering plants, for it is to Britain and continental Europe that we are indebted for a large proportion of the plants which, beginning early in the 17th century, have more and more monopolized our disturbed or cleared areas. In fact, during the International Congress at Ithaca in 1926, the European delegates (Borza, Briquet, Chodat, Domin, Hill, Rendle, Svedelius, Wettstein and others) urged the present writer to take them where they could see some truly American plants. All which they had seen about the streets and fields near Ithaca were the common ruderal and agrestal weeds so familiar to them at home! Drawn by a discerning artist, with an eye for technical details of the species, the illustrations should be of utmost service to our floristic and taxonomic students, in showing exactly what the British plant is like, although it must not be overlooked that the plant found in Britain may sometimes differ from that described by Linnaeus or others from outside Britain; and, furthermore, that many European species, adventive with us, first reached us from the Mediterranean or other areas not British. These illustrations, then, are important for us, because in technical groups it is always possible that we have misidentified some of our species. The drawings will, therefore, help set us straight.

Not only our adventive or introduced weeds can thus be checked by those who lack abundant European material. The amphigean plants, native of northern or temperate regions, can be compared. The British *Anemone Pulsatilla, Myosurus minimus, Ranunculus trichophyllus, circinatus* or *reptans* and countless others can now be checked by anyone against their North American representatives; and now for the first time we can, possibly, clear the identities of the plants known with us as *Fumaria officinalis*, for that inclusive series is here illustrated as 10 different species and their reputed specific distinctions shown. It would be a great boon to the user, however, if there were something like diagnoses or keys and if the authenticity of the specimens illustrated were in some way indicated. The letter-file of the present writer contains a note from an outstanding English taxonomist, anxious to prove that a certain British plant is not conspecific with the American one to which it had been referred, pointing out that careful drawings of our plant in American monographs were of no value because the specimens drawn were not cited! In the new British work one has to put the same faith in the exact identity of the plant drawn as he does in many earlier illustrations of quite different plants under the names here used. In the new work, for instance in the case of Part II, plate 18, it is possible to meet difficulties. Without a key one becomes puzzled, for in the habit-sketch (under *Fumaria*) the bracts are shown chiefly as denticulate along the upper margin, but in fig. B the enlarged bract is drawn with this margin entire. Which is correct? Perhaps *Fumaria* is not finally solved.

The foreword to the series is written by Sir Edward Salisbury, Director of the Royal Botanic Gardens at Kew. Consequently, the recent ruling of Sir Edward that the scholarly practice of Kew botanists (as well as such respected

[1] *Drawings of British Plants* by Stella Ross-Craig, Royal Botanic Gardens, Kew. Foreword by Sir Edward Salisbury. Part I. Ranunculaceae; part II. Berberidaceae, Nymphaeaceae, Papaveraceae, Fumariaceae. June, 1948. G. Bell & Sons Ltd., York House, Portugal Street, London, W. C. 2. Pt. I 6 s. net; pt. II 4 s. 6 d. net.

taxonomists as Linnaeus, Lamarck, Willdenow, the DeCandolles, the Hookers, Bentham, Eichler, Kunth, Torrey, Gray and countless others) for many decades, of capitalizing the initial letter of personal specific names, must be abandoned, is here put into practice. This, it is assumed, is supposed to be "progressive"[1]. The results of the abandonment of capital initials for personal specific names may often be unfortunate. Thus, again referring to *Fumaria*, the species, *F. Bastardii*, was named by Boreau in honor of the great French botanist, TOUSSAINT BASTARD but, deprived of its capital initial, the name seems more a dishonor than an honor and one gets the impression that the parents of the distinguished botanist of Angers were blindly optimistic in selecting the given name Tous-saint!

But these little details aside, the new series of Drawings is bound to be most helpful and it will be almost as much needed in America as in Britain.—M. L. F.

OPHRYDIUM; A CORRECTION.—Through an error of the Editors the text-figures on page 5 were called "UNIDENTIFIED OPHRYDIUM". The caption should have been:

FIGS.: 1, individual, OPHRYDIUM animals; 2, animal condensing to a telotroch; 3, telotrochs or free swimming individuals; 4, telotrochs in resting state; 5, individual in process of binary fission?

Readers are asked to note this correction.—EDS.

[1] See note on this subject in RHODORA xlix. 79–81 (1947).

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